

## 1.3

## Experimenting With the Median

## Goals

- Recognize how the median, as a measure of center, responds to changes in the number and magnitude of data values
- Use line plots to display data distributions

In this problem, students explore how responsive the median is to changes in the data values. Does it change if we add a very large or a very small value to the data? How does it react if we make other changes in the data? The idea of the median and its stability is important in making judgments about statistical data.

## Launch 1.3

Explain to students that they are going to explore what happens to the median when the data set changes. They will be asked to add and subtract name lengths written on index cards to determine if the median changes. Since they worked on determining the median in Problem 1.2 using grid paper, you might want to talk about how using the index cards to find the median is different.

Ask each group of students to prepare ten index cards as described in the Student Edition. Have students refer to the data in their books, or display Transparency 1.3. Once they have ordered the names from shortest to longest, have them determine the median ( $11\frac{1}{2}$  letters).

**Suggested Question** Work with the class to find an example for Question A.

- *Let's look at Question A, part (1). Starting with the ten cards, we need to see if we can remove two names without changing the median. Which names might we choose? (You could, for example, remove the shortest name and the longest name.)*

When students understand the nature of the questions in the problem, let them work in small groups on Problem 1.3. Ask them to find at least three possibilities for each question. Remind them to keep a record of what they find out.

Use Think-Pair-Share to do the Explore.

## Explore 1.3

While students are working on the problem, take time to work with students that are having difficulty. Work through a conjecture they suggest and see how it changes the median.

## Summarize 1.3

For each part of the problem, have one or two groups present examples that meet the criteria. You want students to realize that the median is a fairly stable value. It is defined by position; it always marks the midpoint in an ordered set of data. They will later see that this important characteristic makes the median a useful number to statisticians.

Use Question C, part (2), to point out that adding a very large number has little effect on the median. Adding 1,019 to the data has the same effect on the median as adding 16. In Question B, part (2), the median would increase to 12 whether we added 16 and 17 or 900 and 1,000.